CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Ohio Operations Incident
Preliminary Air Monitoring Summary
June 29, 2014
Hannibal, OH

This report discusses air monitoring data recorded from June 28, 2014 23:18 to June 29, 2014 5:00 in support of response operations conducted for the well control incident near Hannibal, OH.

Real-time air monitoring was conducted in the community and on the eisenbarth well pad for volatile organic compounds (VOCs), benzene, PM_{10}, $PM_{2.5}$, acid gases, and lower explosive limit (LEL) using hand-held instruments such as the RAE © Systems MultiRAE, the UltraRAE 3000, TSI© DustTrak, and Gastec© pump with chemical-specific colorimetric tubes. Data collected using hand-held instruments is provided in Table 1.

Additionally, real-time air monitoring was conducted using remote-telemetering RAESystems© AreaRAE units with ProRAE Guardian monitoring system. AreaRAEs were utilized to monitor for any combination of lower explosive limit (LEL) and volatile organic compounds (VOCs). AreaRAE data is provided in Table 2.

Analytical air sampling was conducted at four fixed locations in the surrounding community.

Table 1: Handheld Real-time Air Monitoring Summary* - 6/28/2014 23:18 – 06/29/2014 05:30

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Range of Detections
Community	Benzene	UltraRAE 3000	11	0	<0.05 ppm
	LEL	MultiRAE Plus	4	0	<1 %
	PM_{10}	DustTrak DRX	34	34	0.03 – 0.367 mg/m^3
	$PM_{2.5}$	DustTrak DRX	27	27	0.03 – 0.298 mg/m^3
	VOC	MultiRAE Plus	64	0	< 0.1 ppm
Well Pad	Acid Gases	Gastec #80	1	0	< 1 ppm
	Benzene	UltraRAE 3000	2	0	< 0.05 ppm
	LEL	MultiRAE Plus	4	0	< 1 %
	PM_{10}	DustTrak DRX	7	7	0.027 – 1.34 mg/m^3
	$PM_{2.5}$	DustTrak DRX	3	3	0.044 – 3.21 mg/m^3
	VOC	MultiRAE Plus	8	1	0.2 ppm

* **Table is based on preliminary real-time data and the information provided has not yet undergone the complete QA/QC process.**

** **If detections were not observed, the instrument detection limit is listed in this column**

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Table 2: AreaRAE Air Monitoring Summary*

06/28/2014 00:14 – 06/9/2014 05:00

Unit	Location	Analyte	No. of Readings	No. of Detections	Range of Detections**
Unit 01	South of Well Pad	LEL	188	0	< 1%
		VOC	188	1	0.2 ppm
Unit 02	North of Well pad	LEL	202	0	< 1%
		VOC	202	0	< 0.1 ppm
Unit 03	Well Pad Main Gate	LEL	202	0	< 1%
		VOC	202	0	< 0.1 ppm
Unit 04	East of Well Pad	LEL	82	0	< 1%
		VOC	82	0	< 0.1 ppm

* Table is based on preliminary real -time data and the information provided has not yet undergone the complete QA/QC process. AreaRAE readings may contain drift events. Drift is defined as interference in the sensor's ability to accurately report the concentration of an analyte and may be brought about by changes in environmental factors (e.g. humidity or temperatu re changes). If accessible, every effort to confirm drift events was made with a secondary instrument, e.g. MultiRAE.

** If detections were not observed, the instrument detection limit is listed in this column

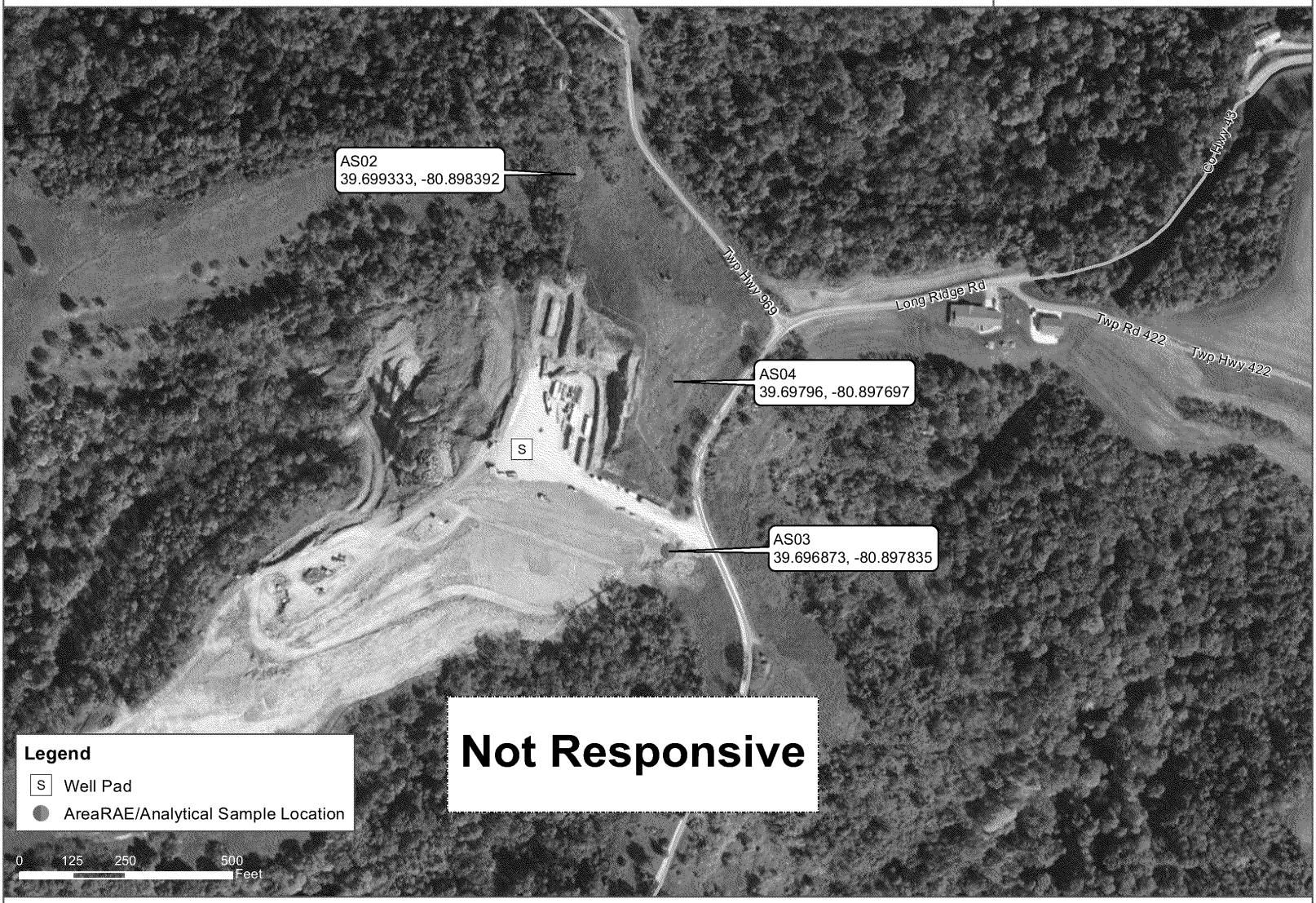
CTEH

AreaRAE and Analytical Sampling Locations

6/29/2014

N

Project: 106393
Client: Statoil
City: Hannibal, OH
County: Monroe



PROJECTION SYSTEM: *UTM Zone 17N* **COORDINATE SYSTEM:** *North American Datum 1983* **Print Date:** *6/29/2014*

CTEH

Manually-Logged Benzene Concentrations

6/28/2014 23:18 - 6/29/2014 05:30

N

Project: 106393
Client: Statoil
City: Hannibal, OH
County: Monroe

PROJECTION SYSTEM: *UTM Zone 17N* **COORDINATE SYSTEM:** *North American Datum 1983* **Print Date:** *6/29/2014*

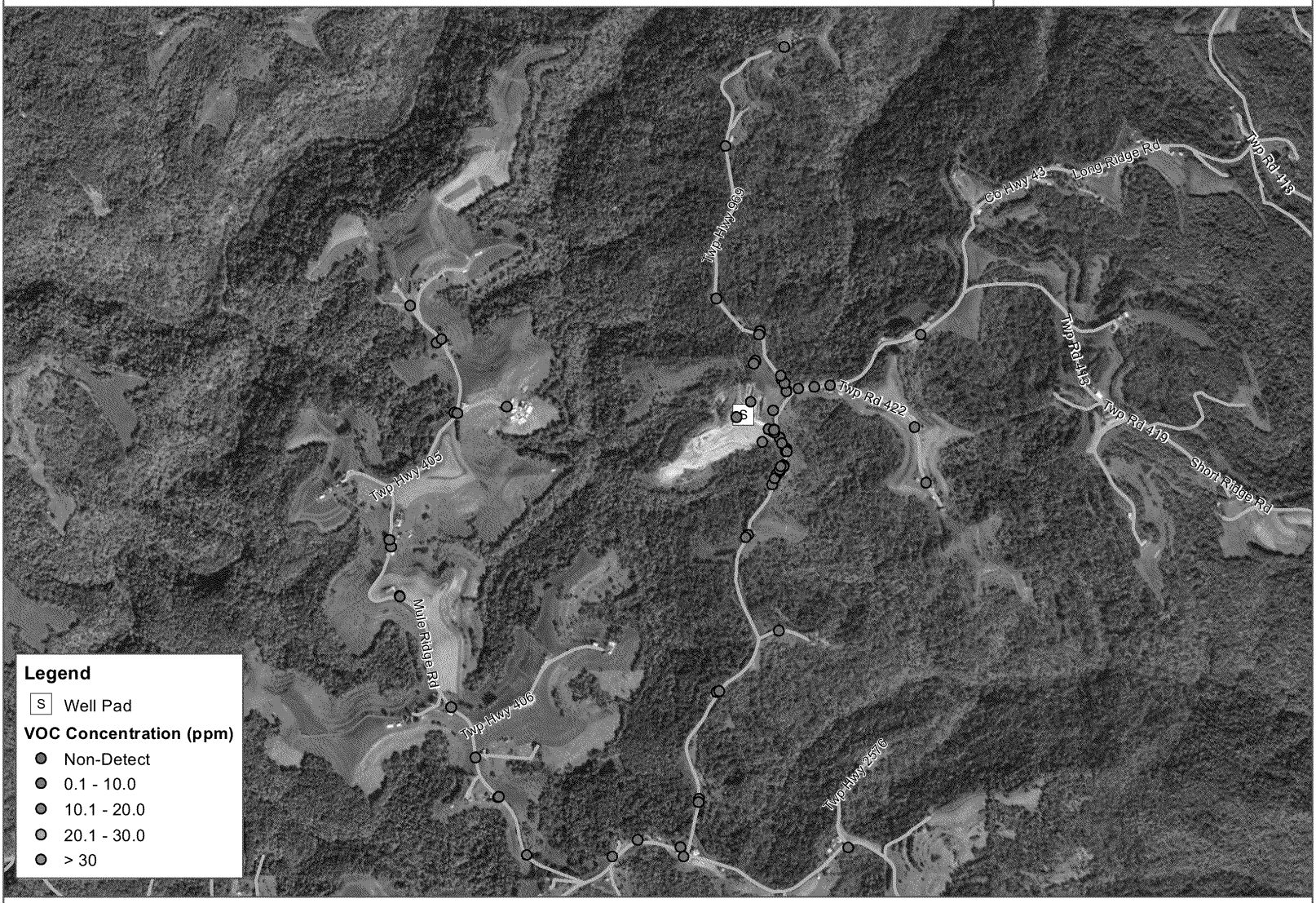
CTEH

Manually-Logged VOC Concentrations

6/28/2014 23:18 - 6/29/2014 05:30

N

Project: 106393
Client: Statoil
City: Hannibal, OH
County: Monroe



PROJECTION SYSTEM: *UTM Zone 17N* **COORDINATE SYSTEM:** *North American Datum 1983* **Print Date:** *6/29/2014*